

Amendments to the Claims

1 Claim 1 (currently amended): A computer-implemented method of managing ~~at least one a~~
2 collaborative process performed in accordance with a first entity and at least a second entity, the
3 method comprising ~~the steps of:~~

4 a computer obtaining information associated with the ~~at least one~~ collaborative process
5 used to design and develop a given product; and

6 based on at least a portion of the obtained information, the computer dynamically building
7 and maintaining an information structure in the form of as a context pyramid structure
8 ~~representative of the collaborative process so as~~ to assist at least one of the first entity and the
9 second entity in managing at least a portion of the collaborative process;

10 wherein the context pyramid structure ~~provides a representation of the~~ represents a status
11 of the collaborative process including one or more global and local tasks, and comprises results of
12 a time offset calculation, a checkpoint calculation and a potential energy level calculation for the
13 one or more global and local tasks involved in the collaborative process using a plurality of flow
14 lines that represent a plurality of levels of resolution of tasks in the collaborative process; and
15 wherein the building and maintaining comprises:

16 creating a lowest-level flow line to represent a lowest-level of resolution, the
17 lowest-level flow line corresponding to a timeline for completing the collaborative process, the
18 timeline containing a plurality of checkpoints for completing the collaborative process, each of the
19 checkpoints represented on the lowest-level flow line by a node, the nodes comprising at least a
20 starting node representing a starting checkpoint on the timeline and an ending node representing
21 an ending checkpoint on the timeline; and

iteratively creating at least one next-higher level flow line to represent a next-higher level of resolution from a next-lower level flow line, for at least one pair of consecutive nodes on the flow line of the next-lower level, the next-higher level flow line corresponding to a next-higher-resolution timeline containing a plurality of higher-resolution checkpoints for completing a portion of the collaborative process that occurs between the checkpoints represented by the consecutive nodes on the lower-level flow line, each of the higher-resolution checkpoints represented on the next-higher level flow line by a node, the nodes on the next-higher level flow line comprising at least a starting node representing a starting checkpoint on the next-higher-resolution timeline and an ending node representing an ending checkpoint on the next-higher-resolution timeline.

Claim 2 (currently amended): The method of claim 1, further comprising ~~the step of~~ incorporating annotated business data into the information structure.

Claim 3 (currently amended): The method of claim 1, further comprising ~~the step of~~ incorporating annotated design data into the information structure.

Claim 4 (currently amended): The method of claim 1, further comprising ~~the step of~~ controlling data flow associated with the at least one collaborative process based on the information structure.

Claim 5 (currently amended): The method of claim 1, further comprising ~~the step of~~ fetching one

2 or more design data features for at least one of monitoring and tracking the ~~at least one~~
3 collaborative process using the context pyramid structure.

1 Claim 6 (original): The method of claim 1, wherein the at least one collaborative process is a
2 business process.

1 Claim 7 (original): The method of claim 1, wherein the at least one collaborative process is an
2 engineering design process.

Claim 8 (canceled)

1 Claim 9 (original): The method of claim 1, wherein the information structure is multi-
2 dimensional.

1 Claim 10 (original): The method of claim 1, wherein the information structure is multi-resolution.

1 Claim 11 (original): The method of claim 1, wherein the obtained information comprises
2 annotated data.

1 Claim 12 (original): The method of claim 1, wherein the obtained information comprises user
2 input.

Claims 13 - 14 (canceled)

1 Claim 15 (currently amended): The method of claim 1, further comprising ~~the step of~~ analyzing at
2 least one of the obtained information and the information structure.

1 Claim 16 (currently amended): The method of claim 15, further comprising ~~the step of~~ generating
2 one or more action representations based on the analyzing ~~[[step]]~~.

1 Claim 17 (currently amended): The method of claim 16, wherein the analyzing ~~[[step]]~~ is rule-
2 based.

1 Claim 18 (currently amended): Apparatus for managing ~~a at least one~~ collaborative process
2 performed in accordance with a first entity and at least a second entity, the apparatus comprising:
3 a memory; and
4 at least one processor coupled to the memory and operative to: ~~[[i)]]~~ obtain information
5 associated with the ~~at least one~~ collaborative process used to design and develop a given product;
6 and ~~[[ii)]]~~ based on at least a portion of the obtained information, dynamically build and maintain
7 an information structure ~~in the form of as~~ a context pyramid structure ~~representative of the~~
8 ~~collaborative process so as~~ to assist at least one of the first entity and the second entity in
9 managing at least a portion of the collaborative process, wherein:
10 the context pyramid structure ~~provides a representation of the~~ represents a status
11 of the collaborative process ~~including one or more global and local tasks, and comprises results of~~

a time offset calculation, a checkpoint calculation and a potential energy level calculation for the one or more global and local tasks involved in the collaborative process using a plurality of flow lines that represent a plurality of levels of resolution of tasks in the collaborative process; and

the building and maintaining comprises:

creating a lowest-level flow line to represent a lowest-level of resolution, the lowest-level flow line corresponding to a timeline for completing the collaborative process, the timeline containing a plurality of checkpoints for completing the collaborative process, each of the checkpoints represented on the lowest-level flow line by a node, the nodes comprising at least a starting node representing a starting checkpoint on the timeline and an ending node representing an ending checkpoint on the timeline; and

iteratively creating at least one next-higher level flow line to represent a next-higher level of resolution from a next-lower level flow line, for at least one pair of consecutive nodes on the flow line of the next-lower level, the next-higher level flow line corresponding to a next-higher-resolution timeline containing a plurality of higher-resolution checkpoints for completing a portion of the collaborative process that occurs between the checkpoints represented by the consecutive nodes on the lower-level flow line, each of the higher-resolution checkpoints represented on the next-higher level flow line by a node, the nodes on the next-higher level flow line comprising at least a starting node representing a starting checkpoint on the next-higher-resolution timeline and an ending node representing an ending checkpoint on the next-higher-resolution timeline.

Claim 19 (currently amended): An article of manufacture for managing a at least one

2 collaborative process performed in accordance with a first entity and at least a second entity,
3 comprising a computer readable storage medium containing one or more programs which when
4 executed ~~implement the steps of:~~

5 obtaining information associated with the ~~at least one~~ collaborative process used to design
6 and develop a given product; and

7 based on at least a portion of the obtained information, dynamically building and
8 maintaining an information structure ~~in the form of as~~ a context pyramid structure ~~representative~~
9 ~~of the collaborative process so as~~ to assist at least one of the first entity and the second entity in
10 managing at least a portion of the collaborative process;

11 wherein the context pyramid structure ~~provides a representation of the~~ represents a status
12 of the collaborative process ~~including one or more global and local tasks, and comprises results of~~
13 ~~a time offset calculation, a checkpoint calculation and a potential energy level calculation for the~~
14 ~~one or more global and local tasks involved in the collaborative process~~ using a plurality of flow
15 lines that represent a plurality of levels of resolution of tasks in the collaborative process; and

16 wherein the building and maintaining comprises:

17 creating a lowest-level flow line to represent a lowest-level of resolution, the
18 lowest-level flow line corresponding to a timeline for completing the collaborative process, the
19 timeline containing a plurality of checkpoints for completing the collaborative process, each of the
20 checkpoints represented on the lowest-level flow line by a node, the nodes comprising at least a
21 starting node representing a starting checkpoint on the timeline and an ending node representing
22 an ending checkpoint on the timeline; and

23 iteratively creating at least one next-higher level flow line to represent a next-

higher level of resolution from a next-lower level flow line, for at least one pair of consecutive nodes on the flow line of the next-lower level, the next-higher level flow line corresponding to a next-higher-resolution timeline containing a plurality of higher-resolution checkpoints for completing a portion of the collaborative process that occurs between the checkpoints represented by the consecutive nodes on the lower-level flow line, each of the higher-resolution checkpoints represented on the next-higher level flow line by a node, the nodes on the next-higher level flow line comprising at least a starting node representing a starting checkpoint on the next-higher-resolution timeline and an ending node representing an ending checkpoint on the next-higher-resolution timeline.

Claim 20 (canceled)

Claim 21 (new): The method of claim 1, wherein the building further comprises:

adding a virtual node beneath the lowest-level flow line;

adding, to the flow line for each of the levels above the lowest-level flow line, a starting node corresponding to the starting node of the lowest-level flow line and an ending node corresponding to the ending node of the lowest-level flow line; and

forming the context pyramid structure from the plurality of flow lines by connecting the virtual node to the starting node of the highest of the levels with a first vector and connecting the virtual node to the ending node of the highest of the levels with a second vector and then compressing all of the flow lines to cause the starting nodes to be placed on the first vector and the ending nodes to be placed on the second vector.

1 Claim 22 (new): The method of claim 1, wherein the maintaining further comprises performing a
2 checkpoint calculation for at least one of the levels of resolution of tasks in the collaborative
3 process, when any of the checkpoints represented by the nodes on the flow line is missed,
4 comprising recomputing a time offset for each successive one of the checkpoints on the flow line
5 and adjusting the node that represents the successive one on the flow line.

1 Claim 23 (new): The apparatus of claim 18, wherein the building further comprises:

2 adding a virtual node beneath the lowest-level flow line;

3 adding, to the flow line for each of the levels above the lowest-level flow line, a starting
4 node corresponding to the starting node of the lowest-level flow line and an ending node
5 corresponding to the ending node of the lowest-level flow line; and

6 forming the context pyramid structure from the plurality of flow lines by connecting the
7 virtual node to the starting node of the highest of the levels with a first vector and connecting the
8 virtual node to the ending node of the highest of the levels with a second vector and then
9 compressing all of the flow lines to cause the starting nodes to be placed on the first vector and
10 the ending nodes to be placed on the second vector.

1 Claim 24 (new): The article of manufacture of claim 19, wherein the building further comprises:

2 adding a virtual node beneath the lowest-level flow line;

3 adding, to the flow line for each of the levels above the lowest-level flow line, a starting
4 node corresponding to the starting node of the lowest-level flow line and an ending node

5 corresponding to the ending node of the lowest-level flow line; and
6 forming the context pyramid structure from the plurality of flow lines by connecting the
7 virtual node to the starting node of the highest of the levels with a first vector and connecting the
8 virtual node to the ending node of the highest of the levels with a second vector and then
9 compressing all of the flow lines to cause the starting nodes to be placed on the first vector and
10 the ending nodes to be placed on the second vector.